Broken Links: Just How Rapidly Do Science Education Hyperlinks Go Extinct?

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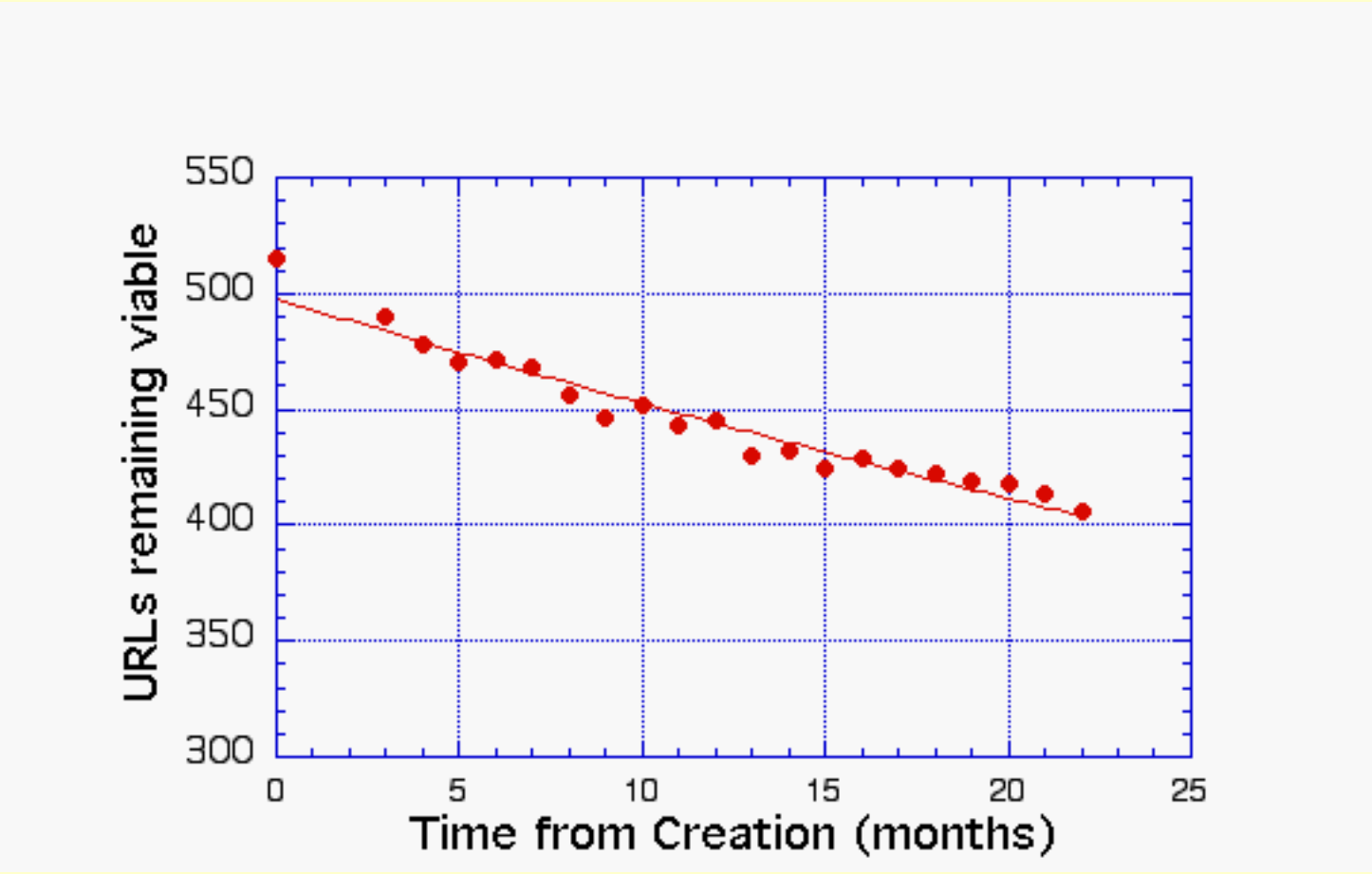
The use of Internet resources has caused much excitement in the science education community because of their potential to enhance both traditional and distance education. However, such resources are not stable and permanent in the sense of a traditional textbook. Although Internet resources may be freely available, there is a lack of certainty that they will be available for students next month, next semester or next year. We have recently developed three graduate-level biochemistry courses designed for high school teachers. Development of these courses relied heavily upon distributed science education resources. As a consequence, they represented a set of authentic science education resources that could be monitored over time to determine their rate of extinction. In total, the three courses contained 515 non-redundant URLs representing either scientific content of science education pedagogy materials. These have been monitored on a monthly basis since the creation of the courses (August 2000). A manuscript reporting this work will be published in the near future [J. Markwell and D.W. Brooks (2002) Broken links: The ephemeral nature of educational WWW hyperlinks. Journal of Science Education and Technology, *in press*]

The loss of these distributed resources is presented below and will be updated monthly.



During he period of study, the loss of URLs fits an extinction equation as follows

$$X = X_0 * e^{(-0.0102 * m)}$$

X is the number of links remaining
X_0 is the initial number of links
m is the number of months

From the data so far, we estimate a half-life for these science education hyperlinks of approximately 55 months.

Extinction of URLs is dependent on domain.
Data after 22months.

Domain (total URLs)	Percent Loss
'edu' (234)	21.3
'com' (73)	46.5
'org' (60)	15

All URLs (515)	21.1

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The three biochemistry courses for high school teachers may be found at

Biomolecules: http://dwb.unl.edu/Teacher/NSF/C10/C10.html

Metabolism: http://dwb.unl.edu/Teacher/NSF/C11/C11.html

Molecular Biology: http://dwb.unl.edu/Teacher/NSF/C08/C08.html

For information about enrolling in one of these courses, contact David Brooks (dbrooks1@unl.edu).

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